



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/895,333	07/02/2001	Ofer Du-Nour	01/21786	6693

G.E. EHRLICH (1995) LTD.  
c/o ANTHONY CASTORINA  
SUITE 207  
2001 JEFFERSON DAVIS HIGHWAY  
ARLINGTON, VA 22202

EXAMINER

VANORE, DAVID A

ART UNIT PAPER NUMBER

2881

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/335 333

Applicant(s)

DU-NOUR OFER

Examiner

David A Vanore

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-15, 17-23, 25-36 and 38-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-15, 17-23, 25-36 and 38-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s): \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other \_\_\_\_\_

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country more than one year prior to the date of application for patent in the United States

Claims 1-7, 9-10, 12-15, 17-18, 20-23, 25-26, 28-36, and 38-39 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Akiyama et al.

Akiyama et al. teaches the following:

1) A production line and associated device in a production line for producing a multilayer semiconductor wafer product comprising a predetermined reflected light intensity spectra (Col. 3 Line 61 - Col. 4 Line 6), a means to detect reflected light intensity spectra (Col. 3 Line 61 - Col. 4 Line 6), and a comparator (Col. 3 Line 61 - Col. 4 Line 6) which are contained in spectrometer 17 (Note Fig. 6) and processing unit 18 as recited in claims 1, 12, 15, 20, 23, 28, 29, 30, and 36.

2) A routing error indicator and a mechanism for interrupting the production of a sample are inherent in the teaching of Akiyama et al. Akiyama et al. teaches that after comparing the detected spectral reflectance and the predetermined spectral reflectance, the processing means makes a decision to stop and alter production parameters, or to continue. This decision and interruption are the same as the routing error indicator and interruption mechanism because the function of the device of Akiyama et al. and the claimed limitation are the same as recited in claims 2, 3, 13, 14, 31, and 32.

3) A plurality of production tools operating in parallel (Col. 9 Lines 14-41) as recited in claims 4, 21, and 33.

4) Each stage having a spectrum comparing means. Akiyama et al. teaches a device having multiple film forming stages and that the thickness of each film is measured based on the reflected spectra and compared to a predetermined spectra at each film forming stage (Col. 2 Line 66-Col. 3 Line 5) followed by an adjustment and rerouting of the production processes as determined by the comparison of spectral data (Fig. 1) as recited in claims 5, 6, 7, 22, 34, and 35.

5) An intensity spectrum deriving means which inherently comprises an illumination means, a reflected radiation detector, an analyzer for determining a frequency spectrum of reflected intensities, and a layer property determining means. The device of Akiyama et al. utilizes an optical spectrometer which irradiates a plurality of wavelengths (Fig. 6) and must have an illumination means, a detector, and analysis means, to determine layer thickness and optical properties including reflection and multiple interference effects (Col. 9 Lines 5-11) of a multilayer wafer as recited in claims 9, 10, 17, 18, 25, 26, 38, and 39.

6) The newly added limitations to claims 1, 12, 20, and 28-30 comprising an intensity spectrum deriver comprising an illuminator, an intensity detector, an analyzer, and a layer property determiner are contained in the Akiyama et al. patent. The device and method of Akiyama et al. call for the measurement of the intensity (min and max values of reflection) of spectral reflection of a film or layers of films. Since Akiyama et al. measures reflectance, there necessarily must be an illuminating source to irradiate

Art Unit: 2881

the substrate. Furthermore, the processing unit of Akiyama et al., which is a computer, uses wavelength measurements and comparison to determine layer properties including thickness by transforming the spectral reflection into a set of wavelength data to determine a layer property by comparison of wavelength data (Col. 9 Line 45 through Col. 10 Line 53).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11, 19, 27, and 40 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Akiyama et al.

Akiyama et al. teaches all limitations as recited above, but fails to explicitly teach the analysis of frequency spectra using Fourier transforms.

Fourier transforms are one of a plurality of mathematical methods for the analysis of detected signals.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select Fourier transforms as a tool for the analysis of frequency spectra because the use of Fourier transforms to analyze spectral data is well known in the art.

### ***Response to Arguments***

Applicant's arguments received in the response filed on February 19, 2003, have been fully considered but are not persuasive.

Applicant submits that Akiyama et al. fails to teach or suggest the use of Fourier or any other orthogonal transform in the analysis of spectral data to determine the properties of a substrate layer based on the detection of reflected radiation from the substrate. Examiner disagrees with this assertion for the following reasons:

Spectroscopes used in the art for obtaining spectral distributions provide data which has already had a Fourier or orthogonal transform applied to said data. Examiner cites Nagoshi et al. which teaches that there are three general kinds of spectroscopes, two of which have Fourier transforms imbedded as part of their core function. The third kind of spectroscope outputs dispersed light through a prism, but as the spectroscope of Akiyama et al. is coupled to a computer, there is no reason to expect that such a spectroscope would be used since computers are not designed to analyze raw light, rather requiring some form of input data. Therefore, the spectroscope detects the spectral reflectance, performs a transform on the detected signal, and outputs data for analysis to the computer of Akiyama et al. (See Nagoshi et al. Col. 1)

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2881

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A Vanore whose telephone number is 703-306-0246. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on 703-308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

dav  
April 19, 2003

